Embrace the Realities…..

Envision the Possibilities

Operation Stay Afloat 2012

DAM SAFETY - Update

Incident

&

Emergency Action Planning

"IEAP"

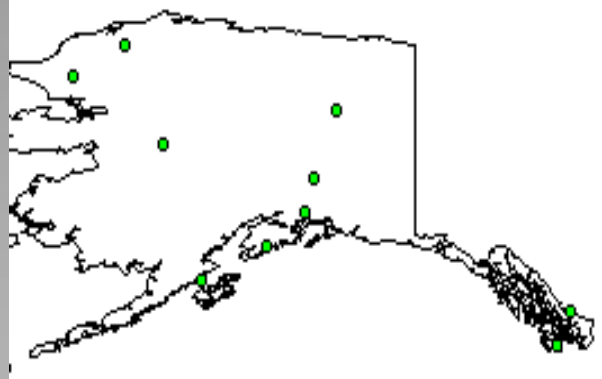
Take Away Topics

- Dams in every county
- Typically dam failure / breach floods are far worse than routine stream flooding events
- Dam INCIDENTS, component &/or progressive failures, more common than total breach
- More than 1/2 of Dams Privately Owned
  - even privately owned dams may present public safety risk
- Many dam owners unprepared with a plan / process to respond to dam safety incidents
  - Many dam owners financially unprepared to deal with their “money pit”

National Dam Safety Review Board

Legislative Charge

- **Monitor the safety of dams in the United States**
- **Monitor state implementation of national dam safety act & state laws**
- **Advise the Director of FEMA on national dam safety program**



National Inventory of Dams map shows locations of major U.S. dams.

IEAPs BECAME A NATIONAL DAM SAFTEY BOARD TOPIC

- About half the states do not have a state statute to require IEAPs for high-hazard potential classification dams.

- Only 48% of the state regulated high hazard dams have IEAPs

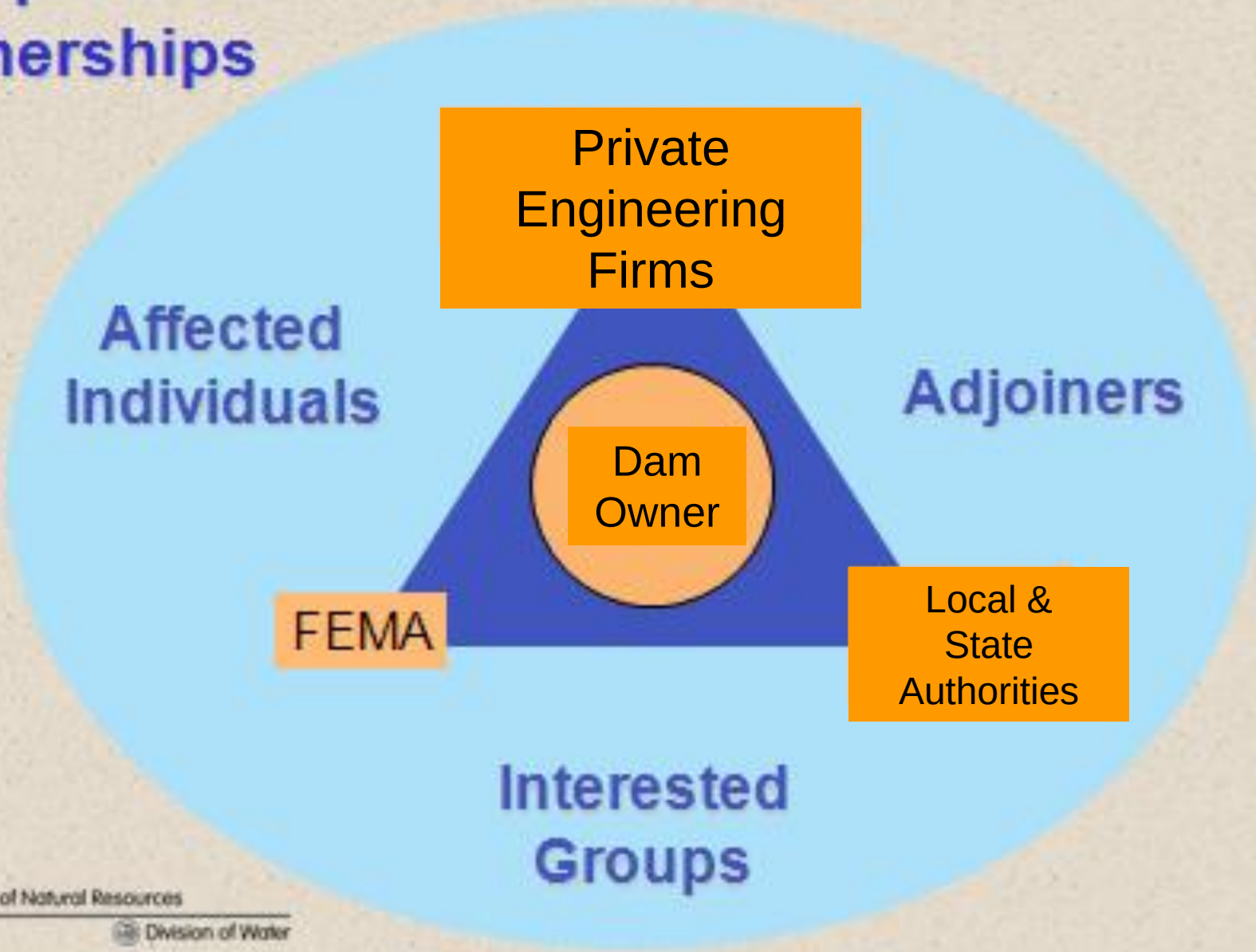
- An unfunded national goal was set of 100% IEAP coverage in five years

Background - IEAP Components

- Need for Owner / Operator Vigilance
- Incident Detection, Evaluation, Event Level Determination
- Multiple Incident Event Levels (cause, severity, progressing?)
  - **Low,** Incident Event Level 3, unusual event, slowly developing
  - Medium, Event Level 2, emergency event, rapidly developing
  - High priority responses, Event Level 1, emergency event imminent dam failure or flash flooding
- Failure Inundation Maps
- Notification – updating Flowcharts (Event Level Focused)
- Responsibilities –Possible Actions (Event Level Focused)
- **Practice! Update! Repeat!**

Incident & EAP

Response Partnerships



IEAP Roles and Responsibilities

Dam owner / operator

- Responsible for all aspects of dam's safety
  - Ongoing vigilance, operations, maintenance, monitoring, reporting
  - Following standard operating practices
  - Budgeting / paying for routine maintenance, professional inspections, emergency assistance, and rehabilitation costs
  - Creating, then when needed, initiating IEAPs
    - detection, on site decision making, notification
    - annually update and practicing IEAPs
- Property Manager and staff often serve like the owner / operator

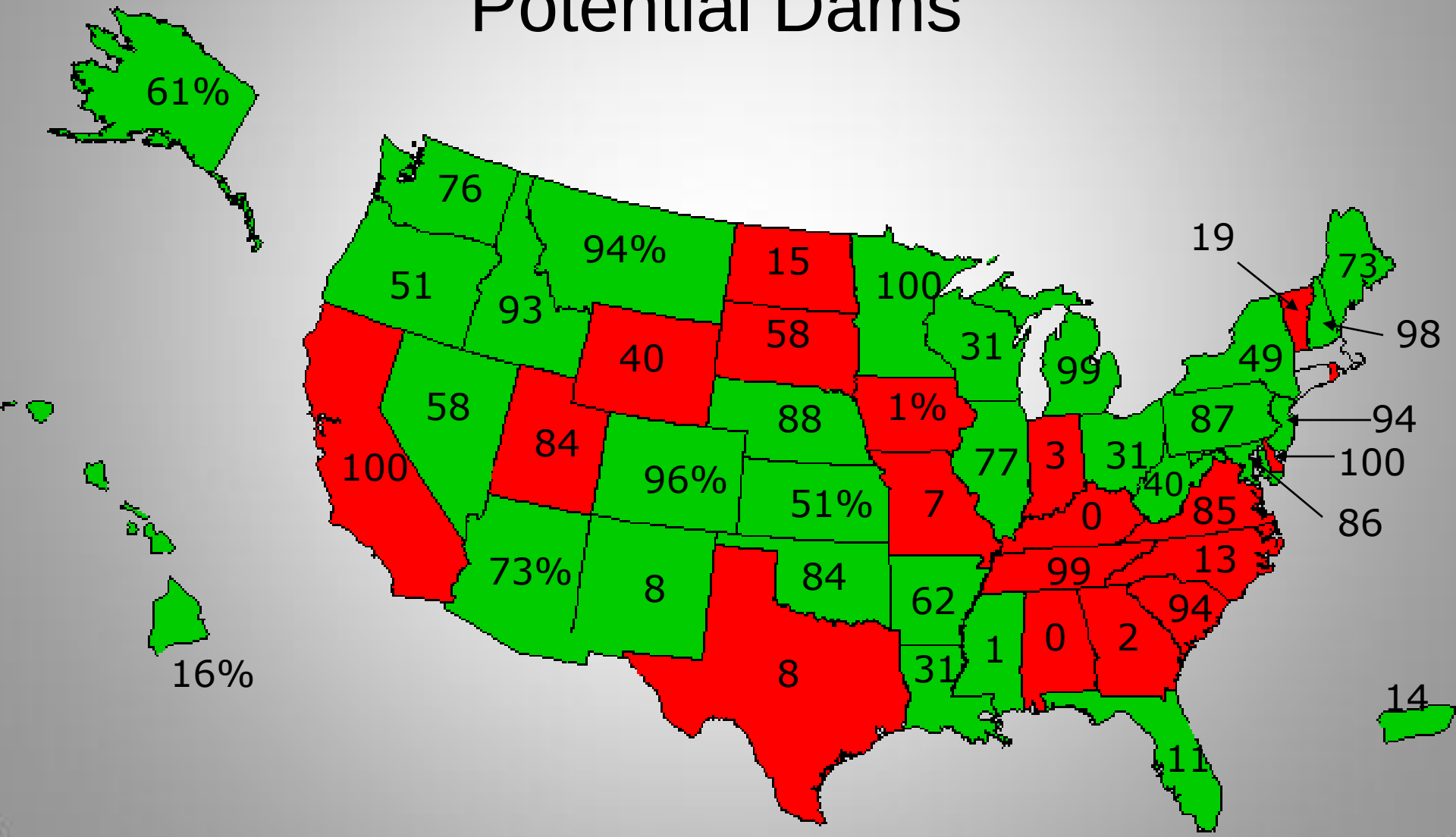
Roles and Responsibilities

Local County EMA and Sheriff

- Encourage owner responsibility
- Encourage owner IEAP development
- Participates in owner's IEAP development

- Assist owners with communication and logistics needs during incidents and emergencies
- Public warnings during dam safety incidents and emergencies
- Evacuation during dam safety emergencies

IEAP Completion % for State Regulated NID High Hazard Potential Dams



Indiana Dams

Indiana Code 14-27-7.5

- Jurisdictional dams ~ 1100
  - ➢20 ft. high
  - ➢ 1 square mile D.A.
  - ➢ 100 ac-ft. volume

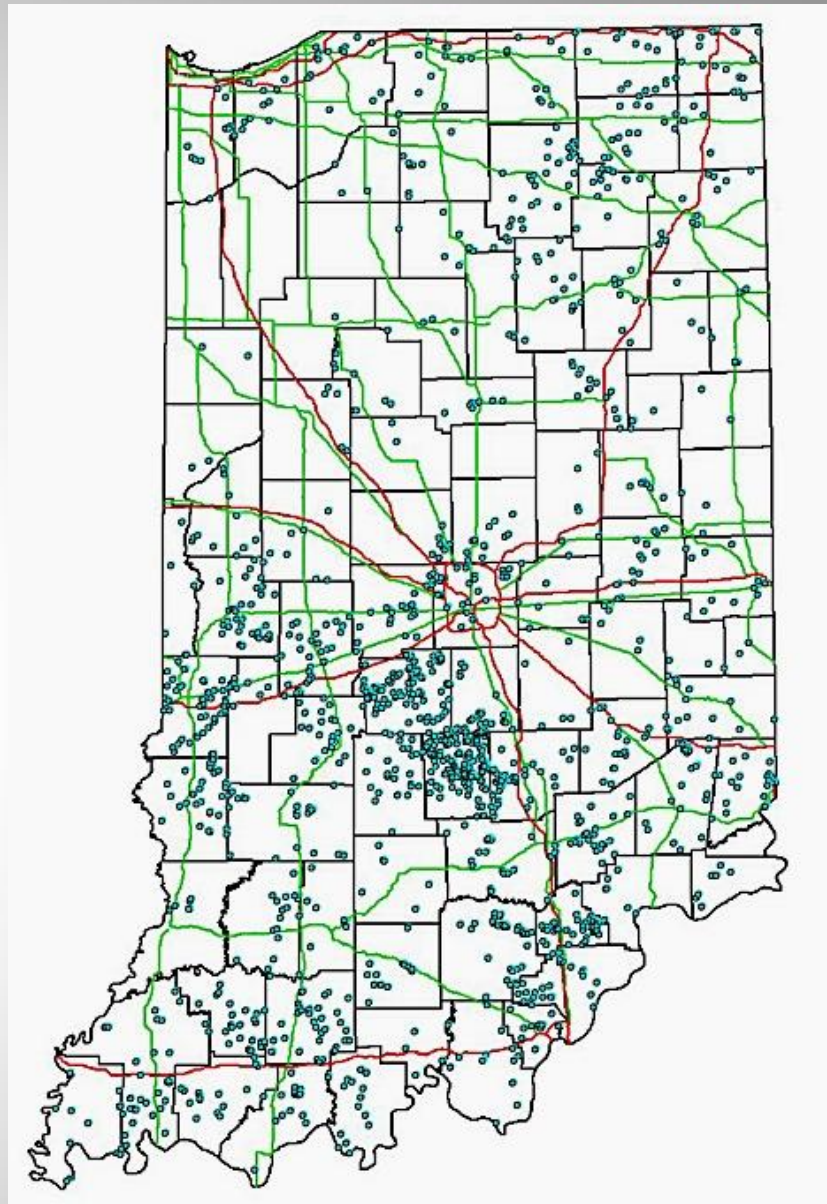
  - High Hazard about 250
  - Significant Hazard about 250
  - Low Hazard about 600

•Hundreds more Non-jurisdictional and / or undocumented dams

•Hazard Creep

•Many dams are privately owned

•A great many dams owners unprepared for the financial responsibilities of these “money pits”



Update - Indiana efforts to increase IEAP coverage

- Attended FERC / dam owner table top exercises
- Created a simplified EAP template – on web site
    - Being updated to reflect IEAP concept

- Conducted educational activities in which EAPs were covered
- State contracted with a consultant to study and outline simplified inundation area techniques

- 18 EAPs for State owned structures created
    - Mock Incident EAP table top exercises run with local officials and stakeholders throughout the State

Update - Indiana efforts to increase IEAP coverage

2009 Pilot EAP Silver Jacket Partnership Project

- Local Dam Owners, Polis Center, DHS, DNR, NRCS, Burke Eng., and Local Officials - Primary Partners
- Limited Federal dam safety grant funds, used to assist dam owners in the creation of an EAP
- Utilizing the model template on Division of Water web site
- Dams with existing inundation maps produced by the federal NRCS (longstanding PL566 partnerships), given an initial priority

2009 Pilot Silver Jacket Partnership Project

Technique

- Owner partnerships fostered by Polis
- Owners coordinated with local stakeholders & hosted a workshop
- At workshop, Polis
  - Led Dams101 presentation - basic dam safety concepts and overview of historical dam failures
  - Discussed roles and responsibilities of dam owner, engineer, and local first responders (where's checkbook?)
  - Created1st written draft of EAP adding names and #'s
  - Tested draft EAP – mock incidents / tabletop exercises
- Repeated for seven high hazard dams groups in counties scattered around the State

2009 Pilot Silver Jacket Partnership Project

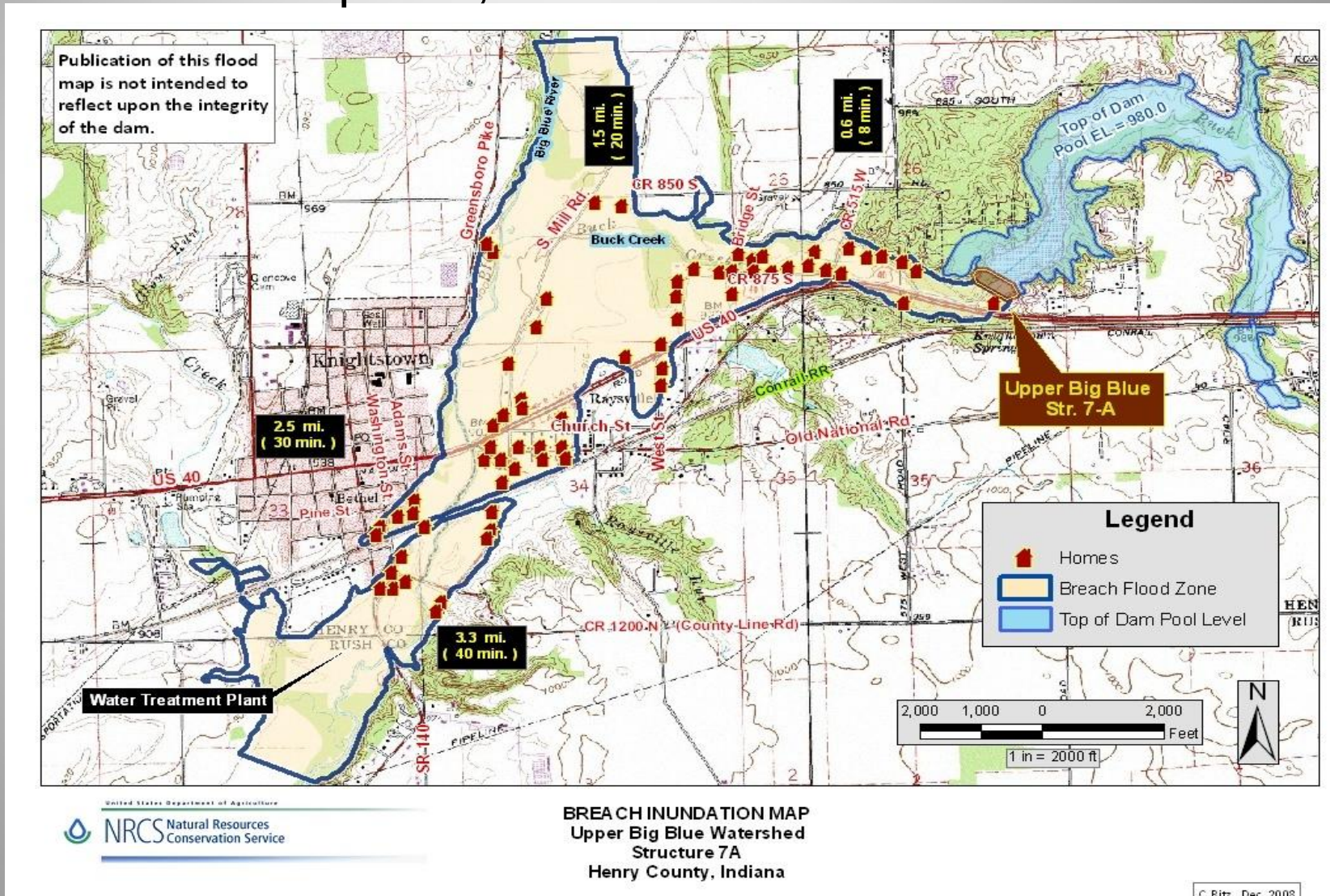
Lessons learned

- Some owners / operators, some officials, still confused about roles, responsibilities in maintaining dam and responding to potential problems at dam
- Some dam owners / operators in shock / grief over their responsibilities
- An often repeated Urban Legend –

  "X agency looked at my dam 10+/- years ago, therefore, they must be responsible for it"
- Many private and public dam owners / operators still hope (sometimes expect) that state or federal government will watch over their dams, provide all technical direction, all emergency response efforts, all required financial resources, and all reconstruction efforts

2009 Pilot Silver Jacket Partnership Project - Lessons Learned

- Inundation maps need to be, simple to read, based on reasonable assumptions, of reasonable cost



Update - Indiana efforts to increase IEAP coverage

2009 Pilot Silver Jacket Partnership Project

Lessons learned

- Need to stress importance of incorporating IEAPs into other county plans, e.g. hazard mitigation plan, comprehensive emergency management plan, response and recovery plans
- Need to create method for engaging and educating downstream public

Update - Indiana efforts to increase IEAP coverage

2009 Pilot Silver Jacket Partnership Project

Lessons learned

Lots of baggage with the word "emergency"

- It's not natural to draw lots of attention to yourself
- No one wants to admit to having an "emergency" situation
- Feeling of helplessness in emergency situations
- Emergency situations seem to demand rapid response – an action that individuals in shock find difficult to accomplish

Thankfully while dramatic, these Event Level 1, imminent / occurring dam failure situations – are not the most common occurrence

Even Event Level 1, complete breach dam failure situation – somewhat rare

Update - Indiana efforts to increase IEAP coverage

2009 Pilot Silver Jacket Partnership Project

Most Important Lesson learned

Need to stress Focus on Incidents (thus IEAPs)
These more common events offer time for preplanned responses to

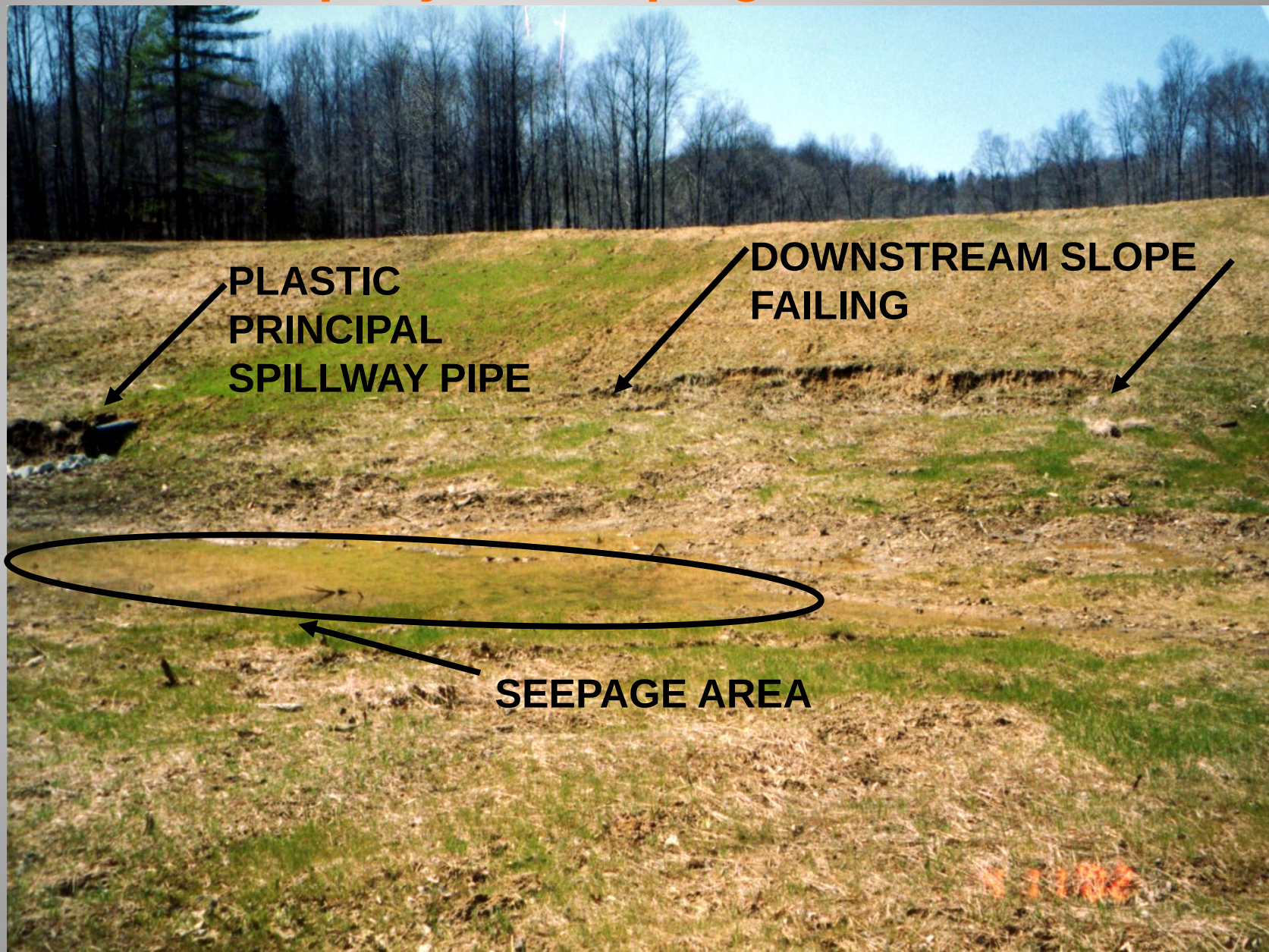
- **Low,** Incident Event Level 3, unusual events that are slowly developing

  &

- **Medium**, Event Level 2, emergency event, rapidly developing

We learned we need to Focus owners / operators on limiting advancement of Incidents such as the following – before they progress & become worse

Incident Event Level 3, slowly developing, or Event Level 2, rapidly developing



Incident Event Level 3, slowly developing, or Event Level 2, rapidly developing

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Incident Event Level 3, slowly developing, or Event Level 2, rapidly developing

Update - Indiana efforts to increase IEAP coverage

2009 Pilot Silver Jacket Partnership Project

Summary Lessons learned

- The dam owner / operator has to be at the center of the IEAP process
- Need simple / reasonable breach failure inundation maps

- Incident does not have the baggage of the word “emergency”
- Incidents are common, need to be reported and resolved
- During IEAP development sessions, need to focus the owners / operators on the goals of **Detection, Reporting, Evaluation, & Resolving** Incidents – before situations become worse

- Partnerships are needed to develop many more IEAPs

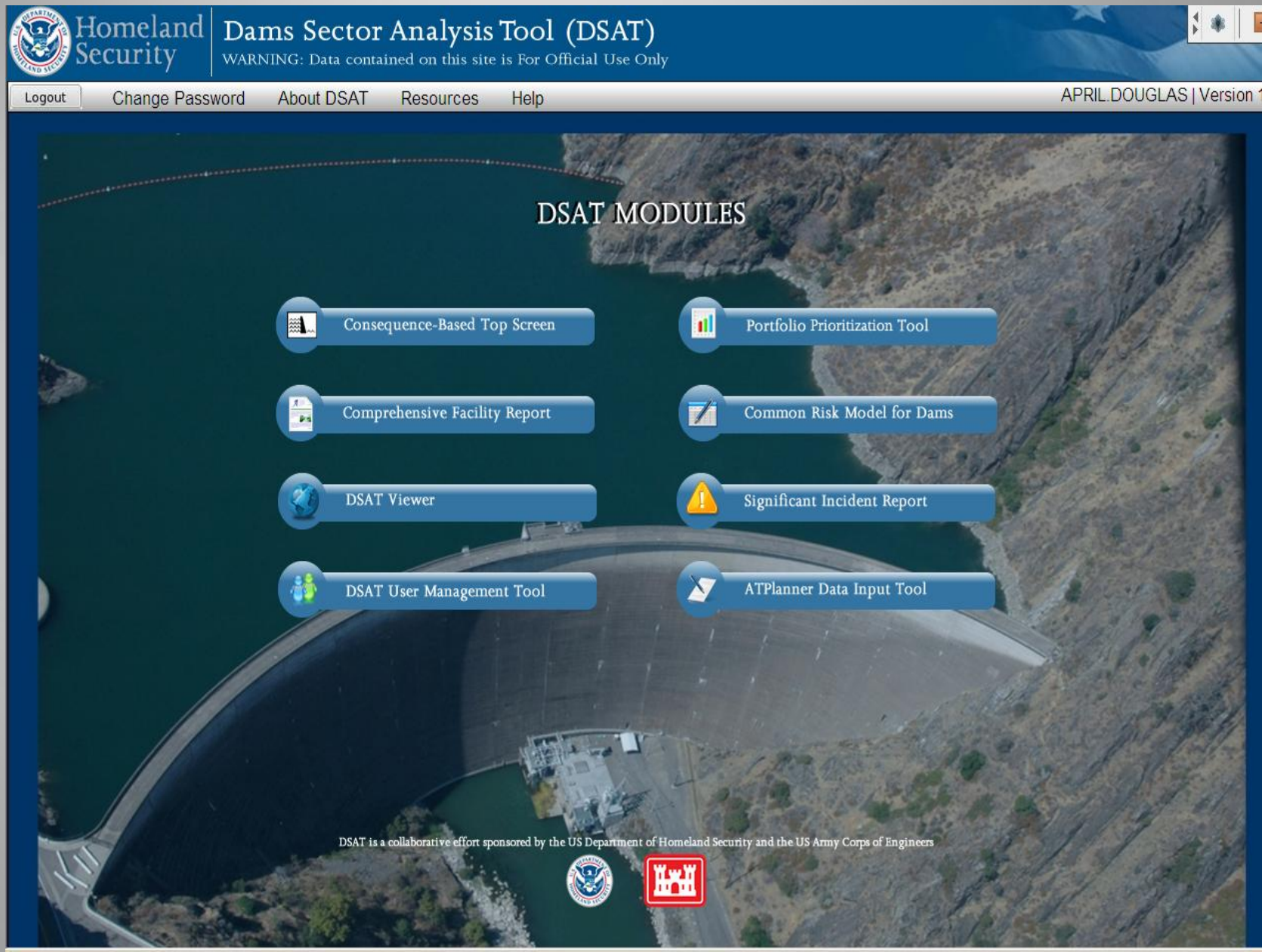
Update on Indiana efforts to increase IEAP coverage over the last several years

2010, 2011 Silver Jacket Partnership Projects

- Limited Federal grant funds being used for additional IEAPs
- Grant funds "Showing the Way" - Not a Solution
  - Currently about 15% coverage
  - If grants continue at same level, 30+ years
- Need Local / Owner partnerships to fulfill the 100% IEAP goal + to make them effective when they need to be implemented

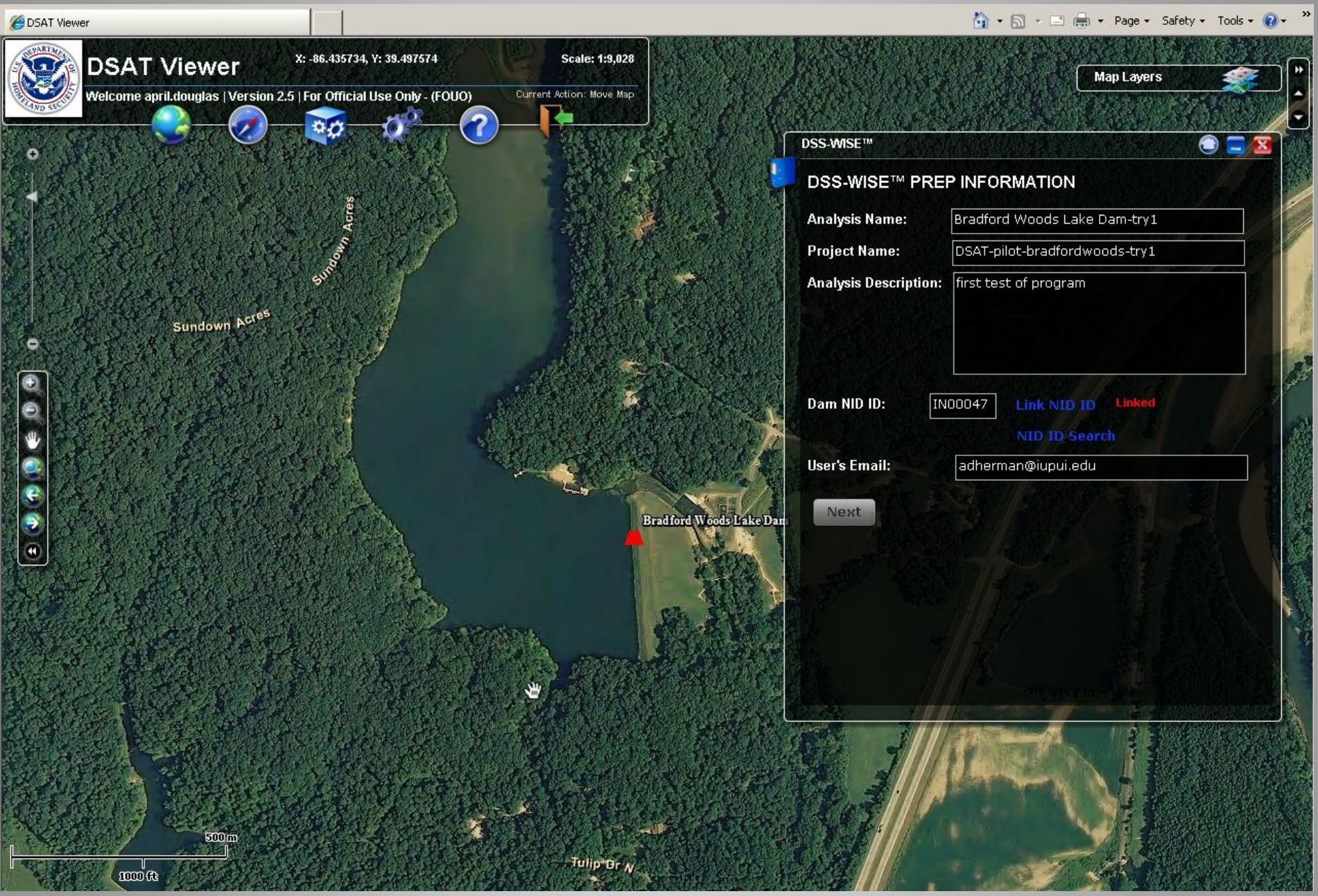
DSAT Inundation Map Pilot Project / POLIS Internship

DSAT - Federal DHS and University of Mississippi Project



Easy to use Model with few Inputs

- National ID and Dam Name
- Normal and Max Storage Volume (acre-feet)
- Normal and Max Pool Elevation (feet)
- Normal Surface Area (acres)
- Pool Elevation at Failure (feet)
- Storage Volume at Failure (feet)


DSAT Viewer
Page
Safety
Tools
DSAT Viewer
X: -86.435734, Y: 39.497574
Scale: 1:9,028
Welcome april.douglas | Version 2.5 | For Official Use Only - (FOUO)
Current Action: Move Map
Map Layers
Sundown Acres
Sundown Acres
Bradford Woods Lake Dam
DSS-WISE™
DSS-WISE™ PREP INFORMATION
Analysis Name:
Bradford Woods Lake Dam-try1
Project Name:
DSAT-pilot-bradfordwoods-try1
Analysis Description:
first test of program
Dam NID ID:
IN00047
Link NID ID
Linked
NID ID Search
User's Email:
adherman@iupui.edu
Next
500 m
1000 ft
Tulip Dr N

Dam Name: Bradford Woods Lake Dam (NID: IN00047)

Analysis Case: Bradford Woods Lake Dam-try1

RESERVOIR/POOL PROPERTIES

Max Storage Volume (acre-feet):	5525
Pool Elevation for Max Storage Volume (feet):	646.7
Normal Storage Volume (acre-feet):	1162
Pool Elevation for Normal Storage Volume (feet):	628
Normal Surface Area (acres):	105.7

Select Upstream Pool/Reservoir Location

Pool/Reservoir: 39.499329 \ -86.435048

Please Follow These Data Format Requirements Where Acceptable
-NAVD 88(datum), From Mean Sea Level
-Value in Specified Units
-Numeric Value Only

Next

Dam Entry/Update

General | Site Locations | Federal | Rolodex | Events | Actions | Outlet Gates | Images | Doc Locations

Name	National ID	State ID
Dam: BRADFORD WOODS LAKE DAM	IN00047	55-4

Dam Type: EARTH
Dam Purpose: Recreation
Nearest Town: Beech Grove
Distance To Town: 2.0 Mi.

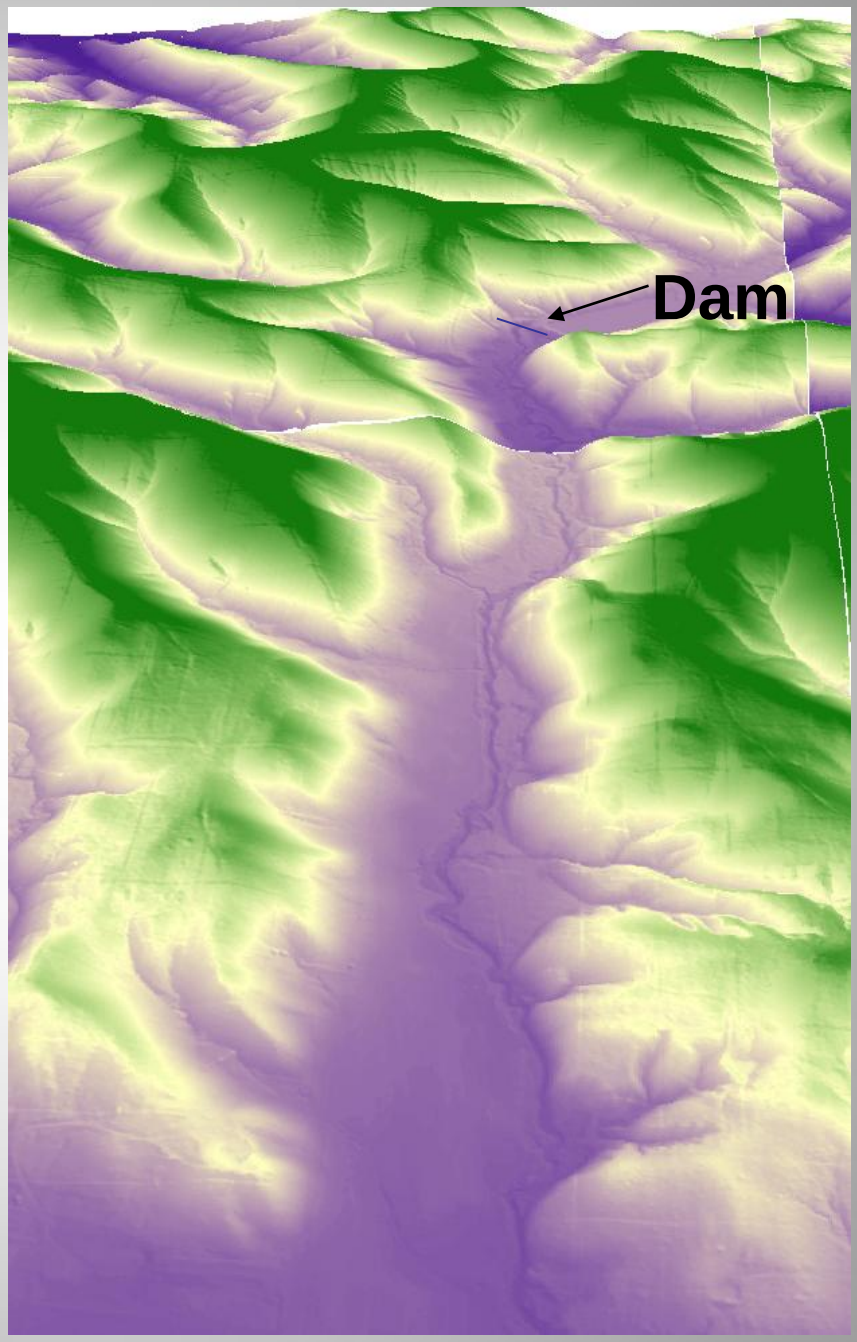
Alias/Former Name: OLD SWIMMIN HOLE LAKE
Delete | Add | Update | Undo | Prior | Next
Entry 1 of 1

Designer:
Ownership Type: PRIVATE

Pertinent Data | Additional Info | Geology/Core/Foundation

		Data Confidence			Data Confidence
Completion Date:	1960	B	Dam Length:	1,000 ft.	B
Dam Height:	59.0 ft.	B	Structural Height:	59.0 ft.	B
Hydraulic Height:	43.0 ft.	B	Max Discharge:	24,000 CuFt/Sec.	B
Max Storage:	5,525 AcreFt.	B	Normal Storage:	1,162 AcreFt.	B
Surface Area:	105.7 acre	B	Drainage Area:	18.3 SqMi.	B
Freeboard:	18.7 ft.	B			
Crest Width:	25.0 ft.	B			

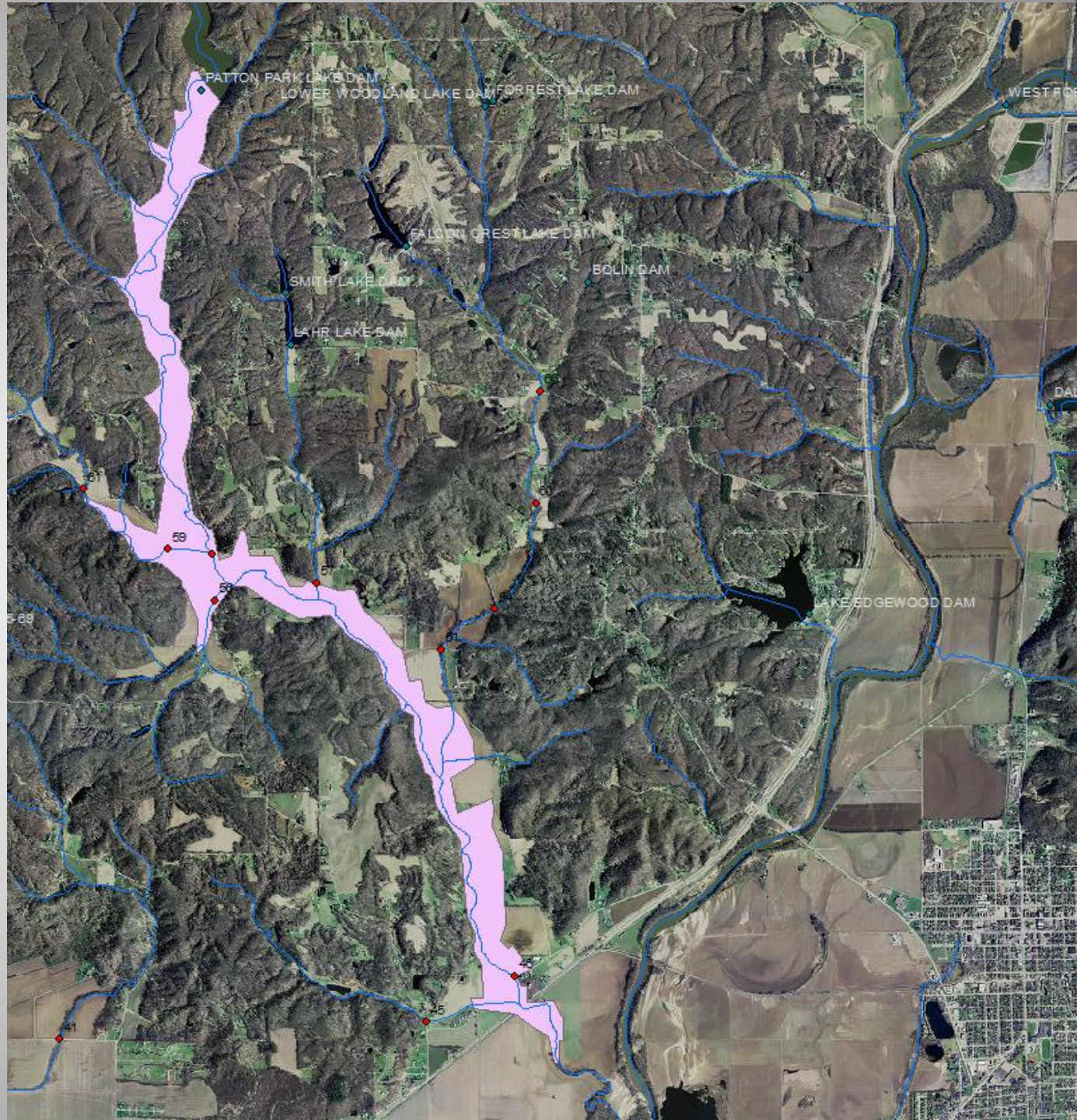
Add | Update | Undo | Find | Results | Exit



Shape file produced – emailed to user from U of Miss.

Data clean up, multiple runs, and judgment required

Much more capability to DSAT and the data
than being explored by Pilot project



Closing

Focus of the National Dam Safety Initiative –
"To Reduce the dam failure risk to downstream lives and property"

Need for future Local / Owner partnerships to fulfill the National 100% IEAP goal

Encourage owners
to
“Maintain ‘em or
Drain ‘em”